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IN THE UNITED STATES PATENT & TRADEMARK OFFICE

IN RE APPLICATION OF	:
HAJIME IKUNO, ET AL.	: EXAMINER: MORILLO, J.
SERIAL NO: 10/620,388	: GROUP ART UNIT: 1742
FILED: JULY 17, 2003	: RCE FILED APRIL 18, 2007
FOR: PISTON MADE OF ALUMINUM CAST ALLOY AND METHOD OF MANUFACTURING THE SAME	:

THIRD DECLARATION UNDER 37 C.F.R. § 1.132

COMMISSIONER FOR PATENTS
ALEXANDRIA, VIRGINIA 22313

SIR:

I, Hajime Ikuno, a citizen of Japan, hereby declare and state that:

1. I have a Master's degree in metallic material engineering, which was conferred upon me by Osaka University located in 2-1 Yamadaoka, Suita, Osaka, Japan.

2. I have been employed by Toyota Central Research & Development Laboratories, Inc., since 1985 and I have a total of 22 years of work and research experience in the field of metallic materials.

3. The following experiments were carried out by me or under my direct supervision and control.

4. The experimental conditions used to create Tables 9, 10 and 11 of the specification were used to produce the attached Table and twenty-one figures.

5. The Table presents compositional data for the Al alloys appearing in the twenty-one figures. The first twenty figures show the microstructure of twenty alloys each containing an amount of Ca within the "Ca (Calcium) : 0.0005-0.003 mass %" of independent Claims 1, 15, 26 and 31. The twenty-first figure shows the microstructure of a comparative twenty-first Al alloy (i.e., comparative example sample No. A3, see specification at page 46, Table 9 and Fig. 7) with only 0.0002 mass % Ca and having a coarse, non-homogeneous microstructure.

6. The Table and figures show that the significant improvement in homogeneous microstructure (texture) that is achieved in accordance with the present invention over the range of "Ca(Calcium) : 0.0005-0.003 mass%" is achieved over the ranges of Ti, Si, Cu, Fe, Ni, P, V, Zr and Mn respectively featured in independent Claims 1, 15, 26 and 31.

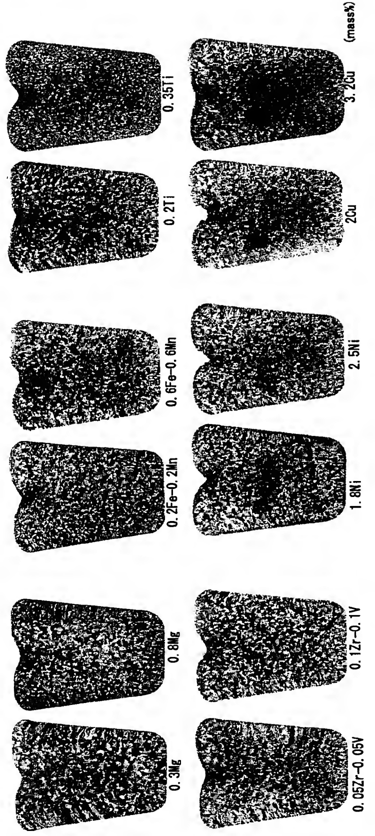
7. I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of this application or any patent issuing thereon.

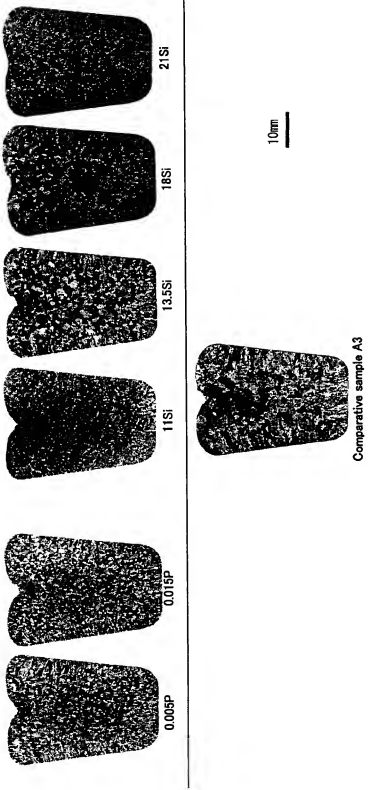
8. Further declarant saith not.

Date: June 25, 2008 Hajime Ikuno

Hajime Ikuno

Attached:
Table
Twenty-one figures


(mass%)
0.35Ti
3.2Cu
0.2Ti
2Cu
0.6Fe-0.6Mn
2.5Ni
0.2Fe-0.2Mn
1.8Ni
0.8Mg
0.1Zr-0.1V
0.3Mg
0.05Zr-0.05V



20Si+Mg

11Si-0Mg

10mm

Table

sample Code	chemical composition (mass%)										
	Si	Cu	Mg	Ni	Fe	Mn	Ti	Zr	V	P	Ca
0.3Mg	12.0	3.0	0.3	2.4	0.5	0.5	0.23	0.12	0.08	0.01	0.0014
0.8Mg	11.7	2.9	0.8	2.3	0.5	0.5	0.22	0.12	0.08	0.01	0.0017
0.2FeMn	11.7	3.0	0.6	2.4	0.2	0.2	0.23	0.12	0.08	0.01	0.0012
0.6FeMn	11.3	2.8	0.6	2.2	0.6	0.6	0.21	0.11	0.07	0.01	0.0013
0.2Ti	11.8	2.9	0.7	2.3	0.5	0.5	0.20	0.11	0.10	0.01	0.0014
0.35Ti	11.4	2.9	0.6	2.3	0.4	0.5	0.35	0.11	0.06	0.01	0.0016
0.05ZrV	11.6	2.9	0.6	2.3	0.5	0.5	0.22	0.05	0.05	0.01	0.0015
0.1ZrV	11.5	2.9	0.6	2.3	0.5	0.5	0.23	0.10	0.10	0.01	0.0012
1.8Ni	11.9	2.9	0.6	1.8	0.5	0.5	0.22	0.12	0.09	0.01	0.0012
2.5Ni	11.6	2.8	0.6	2.5	0.5	0.5	0.22	0.11	0.09	0.01	0.0019
2Cu	11.7	2.0	0.7	2.4	0.5	0.5	0.23	0.13	0.09	0.01	0.0013
3.2Cu	11.4	3.2	0.6	2.3	0.5	0.5	0.22	0.12	0.09	0.01	0.0015
0.005P	11.5	3.0	0.7	2.4	0.5	0.5	0.22	0.12	0.10	0.005	0.0015
0.015P	11.4	3.1	0.6	2.3	0.5	0.5	0.23	0.12	0.16	0.015	0.0013
11Si	11.0	2.9	0.7	2.3	0.5	0.5	0.23	0.12	0.10	0.01	0.0015
11Si-0Mg	10.9	3.2	<0.01	2.3	0.4	0.4	0.23	0.10	0.10	0.01	0.0012
13.5Si	13.5	2.9	0.6	2.3	0.5	0.5	0.22	0.12	0.08	0.01	0.0021
18Si	18.0	3.2	<0.01	2.3	0.4	0.4	0.25	0.10	0.10	0.01	0.0010
21Si	21.0	3.0	<0.01	2.4	0.4	0.4	0.21	0.10	0.06	0.01	0.0030
20Si+Mg	20.3	2.9	0.6	2.0	0.4	0.5	0.23	0.09	0.10	0.01	0.0020
A3	13.8	3.0	<0.01	2.3	0.4	0.4	0.20	0.10	0.06	0.01	0.0002